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KINDLY AMEND THIS APPLICATION AS FOLLOWS:

In The Claims:

Please enter replacement claims 583, 642, 648, 670, 678, 684, 706, 711, 712, 723, 735, 794, 800, 822, 830, 836, 858, 863, 864, 876, 887, 946, 952, 974, 982, 988, 1010, 1015, 1016, 1027, 1039, 1043, 1056, 1057, 1098, 1104, 1126, 1134, 1140, 1162, 1163, 1167, 1168, 1179, 1249, 1255, 1270, 1288, 1289, 1304, 1358, 1386, 1398, 1401, 1402, 1417, 1430, 1454, 1516, 1545, 1559, 1562, 1563, 1593, 1599, 1656, 1677, 1716, 1718, 1728, 1729, 1730, 1731 and 1732 as follows:

Clean Version of Replacement Claims

583. (Amended) The process according to claim 569, wherein in said providing or generating step the fragments are provided or generated by one or more primers, nucleoside triphosphates or analogs thereof, or a combination thereof.

642. (Amended) The process according to claim 600, wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component or a chelating component.

648. (Amended) The process according to claim 600, wherein Sig comprises a sugar residue and the sugar residue is capable of complexing with a sugar binding protein or a polysaccharide binding protein.

670. (Amended) The process according to claim 657, wherein said indicator molecule comprises a member selected from the group consisting of a fluorescent component, a chromogenic component, a chemiluminescent component, a chelating component, and a combination of any of the foregoing.

678. (Amended) The process according to claim 601, wherein A comprises a member selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

684. (Amended) The process according to claim 601, wherein A comprises a sugar residue and the sugar residue is capable of complexing with a sugar binding protein or a polysaccharide binding protein.

706. (Amended) The process according to claim 693, wherein said indicator molecule comprises a member selected from the group consisting of a fluorescent component, a chromogenic component, a chemiluminescent component, a chelating component, and a combination of any of the foregoing.

711. (Amended) The process according to claim 710, wherein said one or more indicator molecules comprise fluorescent nucleotides or nucleotide analogs.

712. (Amended) The process according to claim 711, wherein said fluorescent nucleotides or nucleotide analogs comprise fluorescent DNA.

723. (Amended) The process according to claims 722 or 726, wherein said organism is selected from the group consisting of bacteria, fungi, viruses, yeast, mammals, and a combination of any of the foregoing.

735. (Amended) The process according to claim 721, wherein in said providing or generating step the fragments are provided or generated by one or more primers, nucleoside triphosphates or analogs thereof, or a combination thereof.

794. (Amended) The process according to claim 752, wherein Sig comprises a member selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, a hormone component, a metal containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

800. (Amended) The process according to claim 752, wherein Sig comprises a sugar residue and the sugar residue is capable of complexing with a sugar binding protein or a polysaccharide binding protein.

822. (Amended) The process according to claim 809, wherein said indicator molecule comprises a member selected from the group consisting of a fluorescent component, a chromogenic component, a chemiluminescent component, a chelating component, and a combination of any of the foregoing.

830. (Amended) The process according to claim 753, wherein A comprises a member selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

836. (Amended) The process according to claim 753, wherein A comprises a sugar residue and the sugar residue is capable of complexing with a sugar binding protein or a polysaccharide binding protein.

858. (Amended) The process according to claim 845, wherein said indicator molecule comprises a member selected from the group consisting of a fluorescent component, a chromogenic component, a chemiluminescent component, a chelating component, and a combination of any of the foregoing.

863. (Amended) The process according to claim 862, wherein said one or more indicator molecules comprise fluorescent nucleotides or nucleotide analogs.

864. (Amended) The process according to claim 863, wherein said fluorescent nucleotides or nucleotide analogs comprise fluorescent DNA.

876. (Amended) The process according to claims 875 or 878, wherein said organism comprises a mammal.

887. (Amended) The process according to claim 873, wherein in said providing or generating step the fragments are provided or generated by one or more primers, nucleoside triphosphates or analogs thereof, or a combination thereof.

946. (Amended) The process according to claim 904, wherein Sig comprises a member selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

952. (Amended) The process according to claim 904, wherein Sig comprises a sugar residue and the sugar residue is capable of complexing with a sugar binding protein or a polysaccharide binding protein.

974. (Amended) The process according to claim 961, wherein said indicator molecule comprises a member selected from the group consisting of a fluorescent component, a chromogenic component, a chemiluminescent component, a chelating component, and a combination of any of the foregoing.

982. (Amended) The process according to claim 905, wherein A comprises a member selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

988. (Amended) The process according to claim 905, wherein A comprises a sugar residue and the sugar residue is capable of complexing with a sugar binding protein or a polysaccharide binding protein.

1010. (Amended) The process according to claim 1009, wherein said indicator molecule comprises a member selected from the group consisting of a fluorescent component, a chromogenic component, a chemiluminescent component, a chelating component, and a combination of any of the foregoing.

1015. (Amended) The process according to claim 1014, wherein said one or more indicator molecules comprise fluorescent nucleotides or nucleotide analogs.

1016. (Amended) The process according to claim 1015, wherein said fluorescent nucleotides or nucleotide analogs comprise fluorescent DNA.

1027. (Amended) The process according to claims 1026 or 1030, wherein said organism is selected from the group consisting of bacteria, fungi, viruses, yeast, mammals, and a combination of any of the foregoing.

1039. (Amended) The process according to claim 1025, wherein prior to said detecting step the fragments are provided or generated by one or more primers, nucleoside triphosphates or analogs thereof, or a combination thereof.

1043. (Twice Amended) The process according to claim 1025, wherein prior to said detecting step, the one or more non-radioactive modified or labeled nucleotides or nucleotide analogs have been incorporated into said nucleic acid fragment or fragments.

1056. (Twice Amended) The process according to claim 1025, wherein in said detecting step, the non-radioactive modified or labeled nucleotides or nucleotide analogs comprise one or more members selected from the group consisting of:

(i) a nucleotide or nucleotide analog having the formula

PM—SM—BASE—Sig

wherein

PM is a phosphate moiety or phosphate analog,

SM is a sugar moiety or sugar analog,

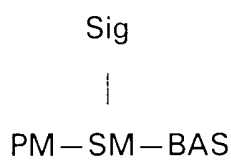
BASE is a pyrimidine, a purine or a 7-deazapurine base moiety or a base analog of any of the foregoing; and

Sig is a detectable non-radioactive moiety,

wherein PM is covalently attached to SM, BASE is covalently attached to SM, and Sig is covalently attached to BASE directly or through a linkage group at a position other than the C5 position when BASE is a pyrimidine moiety or an analog thereof, at a position other than the C8 position when BASE is a purine moiety or an analog

thereof and at a position other than the C7 position when BASE is a 7-deazapurine moiety or an analog thereof;

(ii) a nucleotide or nucleotide analog having the formula



wherein

PM is a phosphate moiety or phosphate analog,

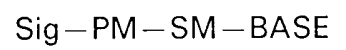
SM is a sugar moiety or sugar analog,

BASE is a base moiety or base analog, and

Sig is a detectable non-radioactive moiety,

wherein PM is covalently attached to SM, BASE is covalently attached to SM, and Sig is covalently attached to SM directly or through a linkage group; and

(iii) a nucleotide or nucleotide analog, said nucleotide having the formula



wherein

PM is a phosphate moiety or phosphate analog,

SM is a sugar moiety or sugar analog,

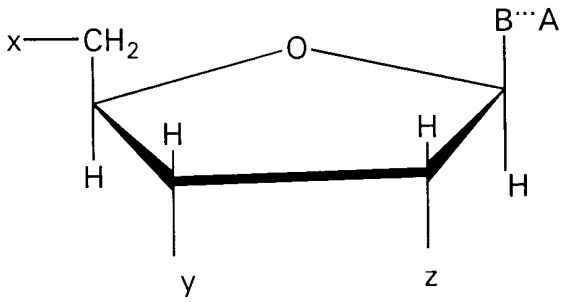
BASE is a base moiety or base analog, and

Sig is a detectable non-radioactive moiety,

wherein PM is covalently attached to SM, BASE is covalently attached to SM, and Sig is covalently attached to PM directly or through a linkage group.

1057. (Twice Amended) The process according to claim 1025, wherein prior to said detecting step, the non-radioactive modified or labeled nucleotides or nucleotide analogs have the structure:

(i)



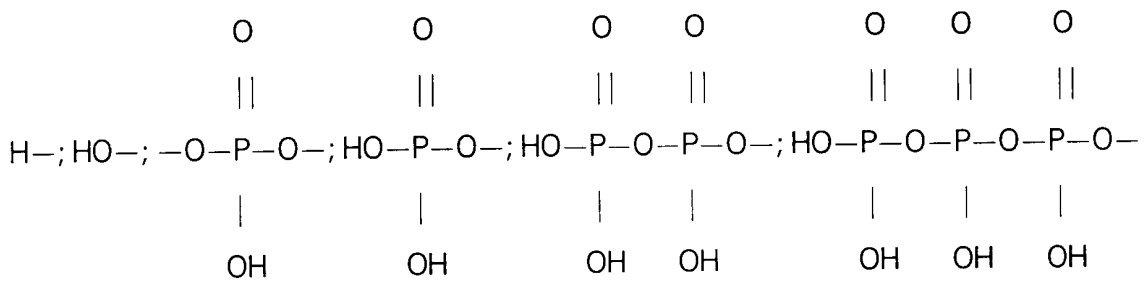
wherein B represents a purine moiety, a 7-deazapurine moiety, a pyrimidine moiety, or an analog of any of the foregoing, and B is covalently bonded to the C1'-position of the sugar moiety or sugar analog, provided that whenever B is a purine, a purine analog, a 7-deazapurine moiety or a 7-deazapurine analog, the sugar moiety or sugar analog is attached at the N9 position of the purine moiety, the purine analog, the 7-deazapurine moiety or the 7-deazapurine analog thereof, and whenever B is a pyrimidine moiety or a pyrimidine analog, the sugar moiety or sugar analog is attached at the N1 position of the pyrimidine moiety or the pyrimidine analog;

wherein A comprises at least three carbon atoms and represents at least one component of a signalling moiety capable of producing directly or indirectly a detectable non-radioactive signal; and

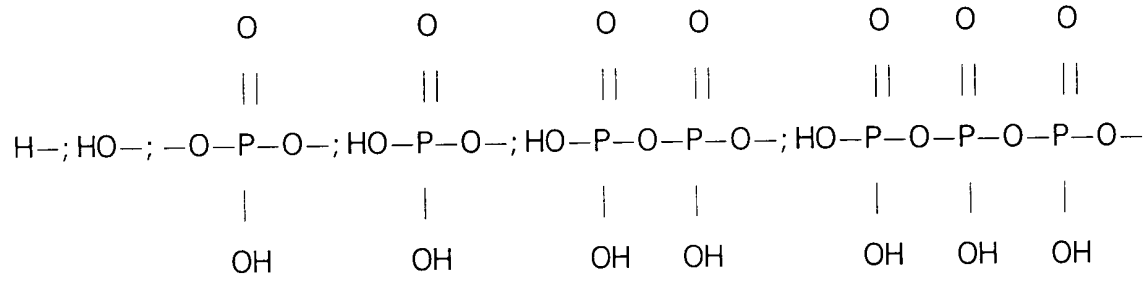
wherein B and A are covalently attached directly or through a linkage group,

wherein if B is a purine or a purine analog, A is attached to the 8-position of the purine or purine analog, if B is a 7-deazapurine or 7-deazapurine analog, A is attached to the 7-position of the deazapurine or deazapurine analog, and if B is a pyrimidine or a pyrimidine analog, A is attached to the 5-position of the pyrimidine or pyrimidine analog; and

wherein x comprises a member selected from the group consisting of:



wherein y comprises a member selected from the group consisting of:



wherein z comprises a member selected from the group consisting of H– and HO–.

1098. (Amended) The process according to claim 1056, wherein Sig comprises a member selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

1104. (Amended) The process according to claim 1056, wherein Sig comprises a sugar residue and the sugar residue is capable of complexing with a sugar binding protein or a polysaccharide binding protein.

1126. (Amended) The process according to claim 1113, wherein said indicator molecule comprises a member selected from the group consisting of a fluorescent component, a chromogenic component, a chemiluminescent component, a chelating component, and a combination of any of the foregoing.

1134. (Amended) The process according to claim 1057, wherein A comprises a member selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

1140. (Amended) The process according to claim 1057, wherein A comprises a sugar residue and the sugar residue is capable of complexing with a sugar binding protein or a polysaccharide binding protein.

1162. (Amended) The process according to claim 1149, wherein said indicator molecule comprises a member selected from the group consisting of a fluorescent component, a chromogenic component, a chemiluminescent component, a chelating component, and a combination of any of the foregoing.

1163. (Twice Amended) The process according to claim 1025, wherein said detectable labeled nucleic acid fragments are detectable non-radioactively by a fluorescent measurement, a chromogenic measurement, a chemiluminescent measurement, or a combination thereof.

1167. (Amended) The process according to claim 1166, wherein said one or more indicator molecules comprise fluorescent nucleotides or nucleotide analogs.

1168. (Amended) The process according to claim 1167, wherein said fluorescent nucleotides or nucleotide analogs comprise fluorescent DNA.

1179. (Amended) The process according to claims 1178 or 1182, wherein said organism is selected from the group consisting of bacteria, fungi, viruses, yeast, mammals, and a combination of any of the foregoing.

1249. (Amended) The process according to claim 1177, wherein said A or Sig comprises a member selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

1255. (Amended) The process according to claim 1177, wherein said A or Sig comprises a sugar residue and the sugar residue is capable of complexing with a sugar binding protein or a polysaccharide binding protein.

1270. (Amended) The process according to claim 1264, wherein said indicator molecule comprises a member selected from the group consisting of a fluorescent component, a chromogenic component, a chemiluminescent component, and a chelating component, and a combination of any of the foregoing.

1288. (Amended) The process according to claim 1287, wherein said one or more indicator molecules comprise fluorescent nucleotides or nucleotide analogs.

1289. (Amended) The process according to claim 1288, wherein said fluorescent nucleotides or nucleotide analogs comprise fluorescent DNA.

1304. (Amended) The process according to claims 1302 or 1305, wherein said organism is selected from the group consisting of bacteria, fungi, viruses, yeast, mammals, and a combination of any of the foregoing.

1358. (Amended) The process according to claim 1298, wherein Sig comprises a member selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, an enzyme, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

1386. (Amended) The process according to claim 1373, wherein said indicator molecule comprises a member selected from the group consisting of a fluorescent component, a chromogenic component, a chemiluminescent component, and a chelating component, and a combination of any of the foregoing.

1398. (Amended) The process according to claim 1394, wherein the moiety which can be detected when the complex is formed is selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, an enzyme, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

1401. (Amended) The process according to claim 1400, wherein said one or more indicator molecules comprise fluorescent nucleotides or nucleotide analogs.

1402. (Amended) The process according to claim 1401, wherein said fluorescent nucleotides or nucleotide analogs comprise fluorescent DNA.

1417. (Amended) The process according to claims 1415 or 1418, wherein said organism is selected from the group consisting of bacteria, fungi, viruses, yeast, mammals, and a combination of any of the foregoing.

1430. (Twice Amended) The process according to claim 1411, wherein said non-radioactive detectable protein is selected from the group consisting of an antibody, a promoter, a repressor and an inducer.

1454. (Amended) The process according to claim 1445, wherein said signaling component or indicator molecule comprises a member selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, an enzyme, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

1516. (Amended) The process according to any of claims 1473, 1474, 1475 or 1476, wherein Sig comprises a member selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, an enzyme, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

1545. (Amended) The process according to claim 1544, wherein said indicator molecule comprises a member selected from the group consisting of a fluorescent component, a chromogenic component, a chemiluminescent component, and a chelating component, and a combination of any of the foregoing.

1559. (Amended) The process according to claim 1553, wherein the moiety which can be detected when the complex is formed is selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, an enzyme, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

1562. (Amended) The process according to claim 1561, wherein said one or more indicator molecules comprise fluorescent nucleotides.

1563. (Amended) The process according to claim 1562, wherein said fluorescent nucleotides or nucleotide analogs comprise fluorescent DNA.

1593. (Amended) The process according to claims 1583 or 1584, wherein said organism is selected from the group consisting of bacteria, fungi, viruses, yeast, mammals, and a combination of any of the foregoing.

1599. (Amended) The process according to claim 1582, wherein said nucleotide analog can be attached terminally to DNA or RNA by an enzyme.

1656. (Amended) The process according to claim 1582, wherein said Sig comprises a member selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, an enzyme, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

1677. (Amended) The process according to claim 1671, wherein said indicator molecule comprises a member selected from the group consisting of a fluorescent component, a chromogenic component, a chemiluminescent component, and a chelating component, and a combination of any of the foregoing.

1716. (Amended) The process according to claim 1712, wherein said one or more detectable oligonucleotides or polynucleotides comprise a member selected from the group consisting of biotin, iminobiotin, an electron dense component, a magnetic component, an enzyme, a hormone component, a metal-containing component, a fluorescent component, a chromogenic component, a chemiluminescent component, an antigen, a hapten, an antibody component and a chelating component.

1718. (Twice Amended) The process according to claim 1712, wherein said detecting step is carried out by means of a member selected from the group consisting of enzymatic measurement, a fluorescent measurement, a chromogenic measurement, a chemiluminescent measurement, a microscopic measurement and an electron density measurement.

1728. (Amended) The process of any of claims 1700, 1701, 1702, 1704, 1706, 1708, 1709, 1710 or 1711, wherein in said providing step, the chelating compounds or chelating components provide a detectable signal that is radioactive, chromogenic, fluorogenic, fluorescent, chemiluminescent, electron dense or magnetic.

1729. (Amended) The process of claim 1703, wherein said detecting step, the chelating compounds or chelating components provide a detectable signal that is radioactive, chromogenic, fluorogenic, fluorescent, chemiluminesscent, electron dense or magnetic.

1730 (Amended) The process of claim 1705, wherein said specific hybridizing step, the chelating compounds or chelating components provide a detectable signal that is radioactive, chromogenic, fluorogenic, fluorescent, chemiluminescent, electron dense or magnetic.

1731. (Amended) The process of claim 1707, wherein said contacting step, the chelating compounds or chelating components provide a detectable signal that is radioactive, chromogenic, fluorogenic, fluorescent, chemiluminescent, electron dense or magnetic.

1732. (Amended) The process of any of claims 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710 or 1711, wherein said detecting step is carried out by a compound or component that is radioactive, chromogenic, fluorogenic, fluorescent, chemiluminescent, electron dense or magnetic.

Delete claims 596, 644, 647, 652, 653, 680, 683, 688, 689, 715, 748, 798, 799, 804, 832, 835, 840, 841, 867, 900, 948, 951, 956, 957, 984, 987, 992, 993, 1019, 1052, 1100, 1103, 1108, 1109, 1136, 1139, 1144, 1145, 1171, 1251, 1254 and 1259.

Add new claims 1739-1748 as follows:

-- 1739. (NEW) The process of any of claims 640, 674, 676, 792, 826, 828, 944, 978, 980, 1096, 1130 or 1132, wherein said fluorescent aromatic or cycloaliphatic group comprises a fluorescent dye. --

-- 1740. (NEW) The process of any of claims 657, 693, 809, 845, 961, 997, 1113, 1149, or 1287, wherein said non-radioactively modified or labeled nucleotides or nucleotide analogs are labeled with the same indicator molecules. --

-- 1741. (NEW) The process of any of claims 657, 693, 809, 845, 961, 997, 1113, 1149, or 1287, wherein said non-radioactively modified or labeled nucleotides or nucleotide analogs are labeled with different indicator molecules. --

-- 1742. (NEW) The process of any of claims 583, 735, 887 or 1039, wherein said primers or said nucleoside triphosphates or analogs thereof are labeled. --

-- 1743. (NEW) The process of any of claims 569, 721, 873, 1025, 1177, 1298, 1473, 1474, 1475, 1476, 1582, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711 and 1712, wherein said base analogs are selected from the group consisting of analogs of pyrimidine, purine and 7-deazapurine. --

-- 1744. (NEW) The process of claim 1743, wherein said purine analogs are selected from the group consisting of thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs and deoxycytidine analogs. --

-- 1745. (NEW) The process of claim 1744, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate. --

-- 1746. (NEW) The process of claim 1744, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid. --

-- 1747. (NEW) The process of claim 1743, wherein said purine analogs are selected from the group consisting of adenosine analogs, deoxyadenosine analogs, guanosine analogs and deoxyguanosine analogs. --

-- 1748. (NEW) The process of claim 1747, wherein said adenosine analogs are selected from the group consisting of tubericidin and toyocamycin. --

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